Delivering Targeted Advertisements in Cable-Based Networks

This application is a Continuation-in-Part (CIP) of U.S. Patent Application number 09/568,084 filed on May 10, 2000, which claims priority of provisional application number 60/133,398 filed on May 10, 1999. This application is also related to co-pending U.S. Application number 09/568,477 filed on May 10, 2000. All of the above-noted applications are herein incorporated by reference but are not admitted to be prior art.

Background of the Invention

The development of compression and transmission techniques for digital video and audio signals coupled with the advent of the Internet have resulted in an ability to transmit audio and video programming to subscribers from a multitude of locations. Reception areas are no longer limited to the reception area of a radio or television transmitting tower, a cable TV head-end, a telephone central office or another geographically determined location. Instead, the subscribers of programming may be distributed over a wide geographical range.

For example, a group of subscribers geographically distributed can have simultaneous access to the programming of interest. In cable television systems, these programs are generally transmitted to groups of subscribers, each group being associated with a node. A node is traditionally associated with a receiver, which receives an optical signal from the cable TV head-end, converts the signal to an electrical signal, and transmits the signal to the homes. The video programming is frequently transmitted from one central location to multiple cable television head-ends, and then distributed to the nodes and

ultimately to the subscribers. Although the viewership for the programs transmitted in this manner may be quite large, generally, there exists characteristics that can be associated with each node due to the respective geographic location.

The nodes in certain areas may have subscribers with a particular range of household incomes or other demographic characteristics that are distinct from the subscribers in other nodes both nearby and distant. Similar characteristics exist for the television systems that receive digital programming from satellites. Generally, the digital video programming is frequently transmitted from one central location to multiple cable television head-ends, and then distributed to the nodes and ultimately to the subscribers.

The transmission of the programming based on specific geographic areas continues to exist, especially in cable-based systems and satellite-based systems. In these systems, the program contents also include one or more advertisements. These advertisements are generally inserted in the program streams by evaluating the program contents, making a rough determination of the target audience, and finding suitable advertisements. For example, beer advertisements may be inserted into the football game programming, and gardening tool advertisements may be inserted into home improvement programming. In cable-based and satellite-based systems, these advertisements are generally displayed as spot messages, and in the Internet environment, these advertisements are displayed as banner advertisements.

Thus, even though prior art advertising schemes try to match the program contents and the advertisements that are displayed within the program contents, such advertisement schemes are not fully effective. Generally, the same advertisements are displayed to all of the subscribers. What is lacking in these

advertising schemes is the idea of delivering targeted advertisements, i.e., creating various subscriber groups for the purposes of targeted advertising and delivering different targeted advertisements to different groups.

Summary of the Invention

The present invention describes a method and apparatus for delivering targeted advertisements over cable-based systems. The principles of the present invention comprise creating a plurality of subscriber groups and delivering one or more targeted advertisements to each group of subscribers.

The subscriber groups may be based on a subzone, a microzone or a branch zone, wherein a subzone is based on a head-end and comprises many nodes, a microzone is based on a node and comprises different subscribers in that node, and a branch zone is based on each branch on a node. Once the groups have been identified, they are characterized based on aggregate subscriber characteristics. These subscriber characteristics may include demographic attributes, such as geographic location, income, family lifestyle, sex and occupation; and/or psychographic attributes, such as travel patterns and hobbies; and product or brand usage attribute. Based on the corresponding aggregate subscriber, the targeted advertisements are delivered to each group.

The targeted advertisements may be delivered to subzones by utilizing a modulator or a splitter. A microzone generally requires an individual splitter. In a branch zone, frequency wavelength division multiplexing may be used for creating different subscriber groups and delivering target advertisements to these subscriber groups. In one embodiment, an optical-to-

electrical converter and an amplifier is used to create different branch zones.

Brief Description of the Drawings

The accompanying drawings, which are incorporated in and form a part of the specification, illustrate the embodiments of the present invention and, together with the description serve to explain the principles of the invention.

In the drawings:

FIG. 1 illustrates the hierarchy of zones and subzones;

FIG. 2 illustrates the formation of subzones from multiple nodes served by a single modulator;

FIG. 3 illustrates the formation of microzones based on the use of a single modulator;

FIG. 4 illustrates the formation of branch zones;

FIGS. 5A-5E illustrate the use of spectrum and transport of analog channels along with multiple versions of digital channels;

FIG. 6A illustrates a router/switch-based architecture for the distribution of signals to branch zones;

FIG. 6B illustrates a frequency re-mapping architecture for the distribution of signals to branch zones;

FIG. 6C illustrates a WDM architecture for the distribution of signals to branch zones;

FIG. 7 illustrates an architecture for ad insertion based on zone descriptions and demographics; and

FIG. 8 illustrates an exemplary formation of zones, subzones, microzones or branch zones.

Detailed Description

of the Preferred Embodiment

In describing a preferred embodiment of the invention illustrated in the drawings, specific terminology will be used for the sake of clarity. However, the invention is not intended to be limited to the specific terms so selected, and it is to be understood that each specific term includes all technical equivalents which operate in a similar manner to accomplish a similar purpose.

With reference to the drawings, in general, and FIGS. 1 through 8 in particular, the apparatus of the present invention is disclosed.

Referring to FIG. 1, a cable television network may be viewed hierarchically consisting of a zone 100 which may, in one embodiment, correspond to a super head-end. The zone 100 is connected to multiple head-ends, HE_1, HE_2, HE_3---HE_n, 120. Generally, a head-end 120 serves a number of nodes 130, and each node 130 serves many subscribers 150. The number of subscribers 150 varies for different systems, but generally each node 130 serves 150 to 750 subscribers 150. In one embodiment, subzones 110 are created based on a particular head-end 120, e.g., all the nodes 130 belonging to one head-end 120 may be grouped in one subzone 110. As shown in FIG. 1, the subzone 110 includes multiple nodes 130, each node serving a plurality of subscribers 150.

FIG. 2 illustrates how advertisements may be delivered to the subzones 110 based on the use of an ad insertion system (AIS) 200, a modulator 210, and a splitter 220. As shown in FIG. 2, the AIS 200 is configured to receive various audio and video

signals. Generally, these signals are digital signals. In one example, the digital video signals are Motion Picture Expert Group-2 (MPEG 2) video signals and the digital audio are either AC3 or Dolby. Alternatively, the audio and video signals may be based on audio and video standards and may be carried in Internet protocol (IP) streams.

Referring to FIG. 2, the subzone 110 is comprised of multiple nodes 130, each node having 150 - 750 subscribers. The AIS 200 forms the advertising streams in a plurality of channels and sends the signals to the modulator 210.

The AIS 200 generates multiple MPEG streams containing the inserted advertisements and the modulator 210 receives base band signals from the AIS 200 and modulates the signals onto a subcarrier in the frequency range of 50 MHz to 1 GHz. As one skilled in the art would know, these signals are modulated into a 6 MHz channel to maintain compatibility with analog video signals. The modulator 210 generates an optical signal by modulating the digital signals onto a subcarrier and subsequently modulating that subcarrier onto a laser signal. The laser signal is then forwarded to the splitter 220.

In one embodiment, the laser signal is based on a distributed feedback (DFB) laser, which provides for highly linear modulation and allows for the combination of analog cable television channels with digital cable television channels. The splitter 220 splits the optical power from the laser signal in the modulator 210 and directs the optical power to a plurality of nodes 130. Generally, the splitter 220 is a 1 to 4 splitter, which distributes the optical power to each node 130. Thus, the transmission from the modulator 210 through the splitter 220 is based on an optical transmission with an optical fiber connecting the modulator 210 to the splitter 220 when they are located in

separate chassis, and an optical fiber connecting the splitter 220 to the node 130. According to one embodiment, the transmission takes place in a 1.3 micrometer window where the linear DFB lasers are readily available at a low cost. In this case, the optical fiber has appropriate dispersion characteristics to allow transport of a full spectrum of analog and digital signals in the 50 - 750 MHz range. In some instances, a range of 750 MHz - 1 GHz may be covered.

The transport of various digital signals may be accomplished by utilizing known technologies. In one embodiment, the transport is accomplished by taking the baseband MPEG signal and encoding it in a quadrature amplitude modulation (QAM) format, typically a 64 or 256 QAM format, and digitally modulating a subcarrier in the 50 - 750 MHz range. The modulator 210 takes the baseband signal, transforms it to the QAM format with the appropriate encoding (forward error correction and other necessary encoding) and modulates the QAM signal to the subcarrier, which directly modulates the laser signal. In an alternate embodiment, a continuous signal may be used from a laser signal with an external modulator used to form the digitally modulated optical signal.

Once different subzones 110 have been created, the subscriber characteristics of different subscribers 150 located in each subzone 110 are evaluated. These characteristics may be used on several dimensions, including, demographic attributes such as geographic location, income, family lifecycle stage, occupation, and sex; psychographic attributes such as travel patterns and hobbies; and product and brand usage attributes. Such attribute information may be collected from several different sources including questionnaires the subscriber completes when they sign up for the cable television service.

Thus, the demographic and/or psychographic characteristics of the subzone 110 are based on different demographic or psychographic characteristics of the subscribers 150 located in that subzone 110. The characteristics of the subzone 110 are reflected as an aggregate of characteristics of each of the subscribers 150 within that subzone 110.

Targeted advertisements may then be selected based on the characteristics of the subzone 110. This permits advertisements to be directed (more targeted). For example, if the aggregate characteristics illustrate that most of the subscribers 150 in the subzone 110 are young couples with small children, then that subzone 110 may be targeted with advertisements relating to children's toys, children's clothes, etc.

It is to be noted that at times individual subscriber characteristics may not be available, e.g., the subscribers may choose not to fill in the questionnaire and supply relevant information. In these cases, group characteristics may be utilized. For example, there are many commercially available databases and research bureaus that collect and provide subscriber demographics based on zip code information. The demographic information may be further narrowed to Zip+4 information (5-15 homes) (i.e., based on a demographic database operated by the Claritas Corporation, San Diego, CA). To compute the aggregate subscriber characteristics based on the Zip+4 information, first different Zip+4 clusters located within a zone/subzone/microzone/branch zone are recognized, and then the demographic characteristics associated with each Zip+4 are aggregated to compute the aggregate characteristics of that zone. These demographic databases may also be cross-linked to profile factors or personal information pertaining to the residents at each address (address information obtained from a subscribers

record database). The profile factors typically include; age, income, family composition, number of children, age of the children, type of automobile owned, type of dwelling, zip code, as well as various other demographic, psychographic and lifestyle information. The greater number of profile factors contained in a database, the more useful the database is for targeting the advertising.

FIG. 3 illustrates an advertising targeting system based on microzones 300. In this system, separate AIS 200 are used to form video streams with targeted advertising at the microzone 300 level. As shown in FIG. 3, a microzone 300 represents a single node 130, and thus, individual modulators 210 may be used for each node 130. The advantage of this embodiment is that the individual targeted advertising streams may be crafted for each node 130 and each node 130 receives a set of channels with particular advertisements that are targeted at that node 130 and correspond to aggregate demographic, or psychographic subscriber characteristics of the node 130.

FIG. 4 illustrates another targeted advertising system based on branch zones 430. As shown in FIG. 4, the node 130 is comprised of an optical to electronic conversion unit (O/E) 410 followed by an amplifier 420. The O/E 410 receives a signal transported via an optical fiber 415 and converts that signal to an electrical signal which is transmitted to the amplifier 420 which further produces electrical signals to be distributed to the branch zones 430. In one embodiment, the conversion simply maps the spectrum in the 50 MHz - 1 GHz range from the optical signal onto an electrical signal which can be transported by using the traditional coaxial cable. The subsequent amplifiers 420 may be used in the branches as is well understood by those skilled in the art. As shown in FIG. 4, about four branch zones

430 may be created based on each node 130 and each of the branch zones 430 may receive different targeted advertisements based on the aggregate subscriber characteristics.

FIG. 5A illustrates spectral allocation for channels to a branch zone. In this embodiment, analog channels 500 are placed in the lower end of the spectrum and digital channels 510 are placed in the upper portion of the spectrum. FIG. 5A also illustrates how a plurality of channels may be distributed in which different versions of a program of a network signal having different sets of advertisements may be created. In this arrangement, for example, along with a FOX signal (original programming), a variety of signals including FOX_A, FOX_B, through FOX_n may be transmitted in the digital spectrum. Each of these FOX signals comprise the same programming, but a different set of targeted advertisements. Thereon, each of these signals may be transmitted to different groups of subscribers, wherein subscriber groups are based on subzones, microzones, or branch zones.

In another embodiment, multiple signals having different advertisements are transmitted over the cable network and a set-top determines which signal it should receive. The advantage of this embodiment is that multiple versions of a program stream may be transmitted to the subscriber's home and the equipment located in the home may select which program stream it should display, according to the demographic characteristics of the subscriber. A disadvantage of this embodiment is that the spectrum is used for multiple versions of a channel rather than transmitting one channel over the cable network. When the multiple channels are transmitted to the home, the set-top is made aware of which group it belongs to and when a subscriber requests the FOX channel, the

set-top knows whether the channel that should be selected is FOX_A, FOX_B or one of the other FOX versions.

FIG. 5B illustrates an exemplary case wherein the digital channels 510 comprise targeted advertisement signals 530 and digital video signals 520, which are transmitted separately. At the receiver end, the targeted advertisement signals 530 are received by the set-top for subsequent processing. The analog channels are illustrated as 500. FIGS. 5A and 5B also illustrate how the spectrum may be utilized to transport targeted advertising.

FIG. 5C illustrates how the present invention allows the effective use of the spectrum by transmitting only one version of a program, but with advertisements, which have been selected particularly for the zone, subzone, microzone, or branch zone. For example, the present invention allows for the selection and insertion of the advertisements such that the channel formed has advertisements which are targeted for the subscribers in the corresponding geographic area at the zone, subzone, microzone, or branch zone level. In this case, different versions of the same programming FOX (i.e., FOX, FOX_A, FOX_B) are multiplexed together and transported as 6 MHz digital signals 510 to a field based receiver, which is at the zone, subzone, microzone or branch zone level. The digital signals 510 may be unbundled at the field based receiver, wherein each zone, subzone, microzone or branch zone receives a particular digital signal 510.

The spectrum utilization for the frequency re-mapping scheme is illustrated in FIG. 5D, wherein the multiple versions of the network channels 510 (digital channels, i.e., FOX, UPN, FOX_A, UPN_A) containing alternate programming or advertising sequences are re-mapped for transmission to the individual zones, subzones, microzones, or branch zones, which use less spectrum than the

full spectrum use for transport. Analog channels 500 are not changed.

FIG. 5E illustrates the spectral usage for an exemplary system in which different wavelengths (λ_1, λ_2, λ_3) are used to carry the alternate channels which may be located on the same frequency (f) at each wavelength. In this embodiment, different versions of programming having targeted advertisements are carried at different wavelengths, i.e., FOX_A is carried at λ_1, and FOX_B is carried at λ_2.

It should be noted that any of the techniques described, including the wavelength division multiplexing technique, may be used at the transport level such that a head-end or a super head-end receives the alternate programming streams on different wavelengths. As an example, multiple versions of the FOX channel with different advertisements may be created at a centralized location and transmitted to a super head-end or head-end on multiple wavelengths. The wavelengths are selected at the super head-end or head-end such that the program streams can be directed at the appropriate zone, subzone, microzone or branch zone.

FIGS. 6A-6C illustrate an exemplary system for generating channels at the branch zone level. Referring to FIG. 6A, the O/E 410 transmits an electrical signal to an analog/digital separator 600, which separates the analog signals from the digital signals. In one embodiment, the analog/digital separator 600 is a frequency dividing unit which splits off the frequencies carrying the analog signals from the frequencies carrying the digital signals. Such a frequency separating unit can be constructed using high pass and low pass filters and is well understood by those skilled in the art. The digital signals are received by a

demodulator 610 which demodulates the signals and recreates the baseband digital signals. The baseband digital signals are received by a router/switch 620 which determines which signals should be routed to each branch zone. The router/switch 620 also determines how to separate the appropriate channels for transmission to the branch zone. Generally, each router/switch 620 is connected to four remodulators 630. The remodulators 630 are further connected to combiners 640, wherein each of the combiners 640 receives an analog input from the separator 600 and a digital input from the remodulator 630. The combiner 640 then generates a channel output based on both inputs, which is forwarded to an amplifier 650 for distribution to a branch zone, i.e., branch zone #1, branch zone #2, branch zone #3.

In one embodiment, the digital channel shown in FIG. 5A with different versions of the channels are utilized to create a frequency spectrum for each branch zone. In this embodiment, the number of channels transmitted over the optical fiber to the O/E 410 may be much larger, and utilize much more frequency spectrum than the number of channels transmitted to the branch zone. As an example, a full 1 GHz of spectrum may be used to carry multiple versions of FOX, UPN, and other major networks but once they are received by the router/switch 620 a subset of those channels is sent to the remodulator 630 which uses less frequency spectrum, as an example, may use only 50 - 750 MHz of spectrum.

FIG. 6B illustrates another embodiment, wherein the O/E 410 transmits an electrical signal to the analog/digital separator 600 which separates the analog signals from the digital signals. The digital output of the analog/digital separator 600 is transmitted to the frequency re-mapping module 660. A combiner receives the digital input from the frequency re-mapping module 660 and the analog input from the analog/digital separator 600.

At the frequency re-mapping module 660, different digital signals are re-mapped such that multiple versions of the digital channels containing alternate programming or advertising sequences are re-mapped for transmission to the individual zones or branch zones. The output from the combiner 640 is fed to an amplifier 650 for distribution to a branch zone.

FIG. 6C illustrates the use of a wavelength division multiplexing system for the transport of multiple wavelengths, the transport of alternate program streams and distribution to various branch zones. In this system, a wavelength division demultiplexer 670 receives multiple wavelengths, e.g., λ_1, λ_2, λ_3, λ_4, each wavelength containing a different program stream containing alternate programming or advertisements. The wavelength division demultiplexer 670 demultiplexes the signals and transmits the appropriate suignals to the appropriate O/E 410. The O/E 410 transmits the signals either directly or an alternate to an amplifier 650 for distribution to the individual branch zones, e.g., branch zone #1, branch zone #2, branch zone #3, etc.

Generally, for zones, subzones, microzones or branch zones, different presentation streams based on a single program stream are created. Each of the presentation streams includes programming from the program streams and one or more targeted advertisements.

FIG. 7 illustrates an AIS 700 which is used to determine which ads should be placed in which program streams to create the appropriate presentation streams. As seen in FIG. 7, an ad server 702 provides ads to physical insertion equipment 710. The physical insertion equipment 710 is commonly available and is known to those skilled in the art. The AIS 700 includes products

available from nCUBE Corporation, Foster City, CA and also the equipment from SeaChange International, Inc., Maynard, MA. Both traditional ad insertion equipment and Video on Demand (VOD) based systems can be utilized to provide the physical insertion function as represented by physical insertion unit 710. An ad management system (AMS) 720 is used to control the insertion.

The AMS 720 provides the ability to match ads based upon the subscriber information from a subscriber profiling database 730. In one embodiment, a zone description 732 is sent to the subscriber profiling database 730 which returns the demographics 734 that are used by the AMS 720 to select different targeted advertisements. The targeted advertisements may then be used to form presentation streams. The AMS 720 also relies on an avail profile database 740 in which program data 744 is transmitted to the avail profile database 740 and avail profiles 742 are returned to the AMS 720. The AMS 720 uses this information to determine the best match between the advertisements and the avails as well as the advertisements and the groups of subscribers. In one embodiment, a traffic and billing module 750 is utilized in conjunction with the AMS 720 to monitor what avails are being sold and to whom. The traffic and billing module 750 also receives a report from the AMS 720 indicating that the advertisements have been appropriately placed and should be billed. This is also known as a "make good" on the contract. The actual insertion of targeted advertisements may be accomplished in many different ways by utilizing existing technology.

FIG. 8 shows the overlay of zip code areas, zones and nodes. As shown in FIG. 8, a head-end 100 is coupled to a plurality of nodes 130, and based on this head-end 100, a subzone 110 is created. Based on the node 130 and the subzone 110, a plurality

of microzones 300 are created. Generally, each node 130 has one microzone 300. Each node 130 may be further divided into branch zones 430, wherein each branch zone 430 is based on a branch of the node 130. The branch zone 430 generally comprises a small group of subscribers, and for targeted advertising, each branch zone 430 may serve a group of subscribers. Different presentation streams may be transmitted to each branch zone 430, wherein the selection of the targeted advertisements may depend on the demographic or psychographic attributes of the subscribers in that branch zone 430.

It is to be noted that the principles of the present invention are flexible and may operate with many different profiling schemes that collect demographic and/or psychographic data about the subscribers. The cable-based systems generally have subscriber record databases that hold subscriber records including names, addresses, etc. These subscriber records may also include information about subscriber viewing habits, for example, on-demand services ordered by subscribers. Furthermore, external information about the subscriber from different sources may be collected, e.g., commercially available databases may be used to collect information about demographic attributes based on zip code information.

In the case of microzones or subzones that rely on node or head-end information, aggregate viewing data based on channel changes and other viewing habits may also be collected and evaluated to create demographic and/or psychographic attributes of the subzones or the microzones.

Alternatively, the individual subscriber profiles may be purchased from external sources and then be aggregated to create profiles of subzones, microzones or microzones.

Although this invention has been illustrated by reference to specific embodiments, it will be apparent to those skilled in the art that various changes and modifications may be made which clearly fall within the scope of the invention. The invention is intended to be protected broadly within the spirit and scope of the appended claims.

Claims

What is claimed is:

1. A method for delivering targeted advertisements in a cable-based network, the method comprising:

creating a plurality of subscriber groups;

determining aggregate subscriber characteristics for each of the subscriber groups; and

selecting targeted advertisements for each subscriber group based on the corresponding aggregate subscriber characteristics.

2. The method of claim 1, wherein the subscriber groups are based on a zone.

3. The method of claim 1, wherein the subscriber groups are based on one or more subzones, wherein each subzone comprises a plurality of cable nodes.

4. The method of claim 3, wherein the subzones are created by utilizing a modulator and a splitter.

5. The method of claim 1, wherein the subscriber groups are based on microzones, each microzone comprising a cable node.

6. The method of claim 5, wherein the microzones are created by utilizing a plurality of individual modulators, each individual modulator corresponding to a cable node.

7. The method of claim 1, wherein the subscriber groups are based on branch zones, each branch zone corresponding to a branch of the cable node.

8. The method of claim 7, wherein the branch zones are created by utilizing an optical-to-electrical converter and an amplifier.

9. The method of claim 1, further comprising:

creating a plurality of digital signals,; and

transmitting the digital signals to the subscriber groups, wherein each subscriber group receives a particular digital signal based on the aggregate subscriber characteristics of that group.

10. The method of claim 9, wherein each digital signal comprises entertainment programming and one or more targeted advertisements.

11. The method of claim 10, wherein each of said digital signals are transmitted in a 6 MHz frequency band.

12. The method of claim 10, wherein the entertainment programming is transmitted as a first set of digital signals and the targeted advertisements are transmitted as a second set of digital signals.

13. The method of claim 12, wherein a set-top is provided with instructions indicating which advertisements to select from the second set of digital signals.

14. The method of claim 10, wherein the entertainment programming and the targeted advertisements are statistically multiplexed to form a 6 MHz digital signal.

15. The method of claim 10, wherein the different digital signals are remapped for transmission to different subscriber subgroups.

16. The method of claim 10, wherein the different digital signals are carried as alternate channels located on the same frequency at each wavelength.

17. The method of claim 1, wherein the subscriber groups are based on branch zones, each branch zone receiving a channel input that may be different from a channel input from another branch zone.

18. The method of claim 17, wherein the different channels are created by a frequency separating unit.

19. The method of claim 18, wherein the different channels are routed by a router/switch to the appropriate destinations.

20. The method of claim 18, wherein the different channels are mapped by a frequency re-mapping module to the appropriate destinations.

21. The method of claim 17, wherein the different channels are created by a wavelength division demultiplexer.

22. The method of claim 21, wherein the different channels are routed via an amplifier.

23. The method of claim 1, wherein the subscriber characteristics are based on one or more demographic attributes.

24. The method of claim 1, wherein the subscriber characteristics are based on one or more psychographic attributes.

25. The method of claim 1, further comprising:

receiving profile information about the subscribers in the subscriber group from an external database; and

aggregating the subscriber profile information to generate subscriber group characteristics.

26. A system for presenting targeted advertisements to subscribers in a cable-based network, the system comprising:

an ad management system for determining subscriber groups, for computing subscriber characteristics, and for selecting targeted advertisements based on the subscriber characteristics; and

an ad insertion unit for inserting targeted advertisements in one or more program streams to create a plurality of digital signals.

27. The system of claim 26, wherein the subscriber groups are based on a zone corresponding to a super head-end of the cable network.

28. The system of claim 26, wherein the subscriber groups are based on subzones, each subzone comprising a plurality of cable nodes.

29. The system of claim 26, wherein the subscriber groups are based on microzones, each microzone comprising a cable node.

30. The system of claim 26, wherein the subscriber groups are based on branch zones, each branch zone corresponding to a branch of a cable node.

31. The system of claim 26, wherein the ad insertion unit comprises a modulator and a splitter to transmit said digital signals to different nodes.

32. The system of claim 26, wherein the ad insertion unit comprises a set of individual modulators, each individual modulator corresponding to a node.

33. The system of claim 26, wherein the ad insertion unit comprises an optical-to-electrical converter directly coupled to an amplifier.

34. The system of claim 26, wherein the ad insertion unit comprises a cable router/switch for routing the digital signals to different destinations.

35. The system of claim 26, wherein the ad insertion unit comprises a frequency remapper for mapping the digital signals to the appropriate destinations.

36. The system of claim 26, wherein the ad insertion unit comprises a wavelength demultiplexer for creating multiple wavelengths for the digital signals.

37. The system of claim 26, wherein the ad management system is coupled to a subscriber profiling database, the subscriber profiling database providing profile information about the subscribers.

38. The system of claim 37, wherein the subscriber profiling information is aggregated to generate subscriber group characteristics.

39. The system of claim 26, wherein the ad management system is coupled to a traffic and billing module, the traffic

and billing module provides the subscriber record information to the ad management system.

Abstract of the Disclosure

A method and apparatus for delivering targeted advertisements over cable-based systems. A plurality of subscriber groups are created and one or more targeted advertisements are delivered to each group of subscribers. The subscriber groups may be based on a subzone, a microzone or a branch zone, wherein a subzone is based on a head-end and comprises many nodes, a microzone is based on a node and comprises different subscribers in that node, and a branch zone is based on each branch on a node. Once the groups have been identified, they are characterized based on aggregate subscriber characteristics. These subscriber characteristics may include demographic attributes, such as geographic location, income, family lifestyle, sex and occupation; and/or psychographic attributes, such as travel patterns and hobbies; and product or brand usage attribute. The targeted advertisements may be delivered to subzones by utilizing a modulator or a splitter. A microzone generally requires an individual splitter. In a branch zone, a frequency or wavelength splitter may be used for creating different subscriber groups and delivering target advertisements to these subscriber groups.